



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 1

5 POST OFFICE SQUARE, SUITE 100
BOSTON, MA 02109-3912



RDMS DocID

108458

March 16, 2010

Richard A. Nave, CHMM
Corporate Manager EH&S
MacDermid Incorporated
245 Freight Street
Waterbury, CT 06702

RCRA RECORDS CENTER
FACILITY MacDermid Inc
I.D. NO. CTD001164599
FILE LOC. R-9
OTHER #108458

Re: Technical Review of the September 2009 Site Characterization Report for the MacDermid Incorporated Facility 526 Huntingdon Avenue, Waterbury, Connecticut (Permit # DEP/HWM/CS-151-001; EPA Identification Number CTD001164599)

Dear Mr. Nave:

The U.S. Environmental Protection Agency (EPA) has completed a technical review of the September 2009, Site Characterization Report for the MacDermid Incorporated Facility 526 Huntingdon Avenue, Waterbury, Connecticut. The Report was prepared on behalf of MacDermid Inc., by GEI Consultants Inc., as a requirement of the Stewardship Permit Condition No. II.B., so that MacDermid Inc. may satisfy its Corrective Action obligations in accordance with the Regulations of Connecticut State Agencies (RCSA) Section 22a-449(c)-110(a)(2), and Section 22a-449(c) of the Connecticut General Statutes (CGS).

Technical review comments are contained as an attachment to this letter. Based on the extent of comments and the significant nature of some, please submit a revised Site Characterization Report.

In accordance with Section II.B.12. of the Permit, a revised schedule needs to be submitted that sets out the proposed dates for completion of the remaining investigation, and interim milestones through the completion of remediation.

In addition, please submit a revised cost estimate for financial assurance. The estimate shall include the cost for (1) completion of the investigation activities identified in the Site Characterization Report and technical review comments, (2) anticipated site remediation activities, and (3) any additional regulated unit closure.

Please submit the revised Site Characterization Report with responses to the technical review comments, proposed work plan, cost estimate and revised schedule within ninety (90) days of the date of this letter.

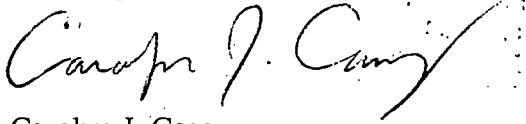
Toll Free • 1-888-372-7341

Internet Address (URL) • <http://www.epa.gov/region1>

Recycled/Recyclable • Printed with Vegetable Oil Based Inks on Recycled Paper (Minimum 30% Postconsumer)

If you have any questions or would like to schedule a meeting with CTDEP and EPA to discuss the comments, please contact me at 617-918-1368 or by email at casey.carolyn@epa.gov.

Sincerely,

A handwritten signature in cursive script, appearing to read "Carolyn J. Casey". The signature is written in dark ink and is positioned above the printed name and title.

Carolyn J. Casey
RCRA Facility Manager

cc: D. Ringquist, CTDEP
J. Chow, EPA

enclosure

**Technical Review of the September 2009 Site Characterization Report
for MacDermid Incorporated
526 Huntingdon Ave. Waterbury, CT
EPA ID CTD001164599
Permit # DEP/HWM/CS-151-001
submitted by GEI Consultants Inc.**

General Comments

1. This investigation appears to be consistent with a Phase II Investigation and should be identified as such. Please revise the title and include such information in the text as appropriate.

2. In any samples, were there any unidentified peaks eluting within the retention time window that were not identified as an arochlor PCB?

Were any unknown compounds or tentatively identified compounds (TICs) found during sample analyses? A list of toxic and hazardous substances that were used at MacDermid was provided in an 8/19/2008 email to Rich Nave, Fred Johnson, and John Cordani. Most of these constituents were not included in the list of COC or in the analyses performed for this site characterization. Please discuss how the current investigation addressed this issue.

3. Due to the elevated levels of chromium in soil samples and a few groundwater samples, please ensure that hexavalent chromium is included as a constituent of concern in subsequent work.

4. Was MW-110 ever physically located? Please show the locations of MW-107 and MW-110 on the figures. Even if the wells are no longer accessible, previous data from these wells is provided and it would be useful to know the locations. In addition, there is a double asterisk by MW-107 in the top row of the table but no notes are provided to explain why. Please revise the table to include a note describing this superscript.

5. Please review the previously collect groundwater results (at a minimum 2001 to 2008 data provided in table 8) and incorporate the results into the AOC summaries in this report. Groundwater is not discussed for AOC-D1, AOC-E1 (other than LNAPL), AOC-K8 (a regulated unit), AOC-L, AOC-K4 through K-7 (The text only discusses MW-113 and apparently only the most recent sampling event since it states that only 2 compounds were detected which does not agree with the historic data. In addition, several of the detected constituents at MW-113 do not have established criteria.).

6. Please provide an updated conceptual site model based on the new data and/or the identification of data gaps or state that no updates to the CSM are necessary and provide justification why (e.g., the results for the Phase II investigation for a particular AOC agree with the conceptual model or not).

7. A single groundwater sampling event in the new wells may not be sufficient to determine that a release has not occurred. For example, seasonal variations may influence the detection of contaminants. The need for multiple sampling events should be based on evaluation of the data using the conceptual site modeling process and DQOs.

8. It does not appear as though soil samples were submitted for TCLP or SPLP in accordance with the work plan. Fewer soil samples were submitted for TCLP analysis than was proposed.

Soil samples do not appear to have been submitted for SPLP based on mass metals. Neither list of analytes for TCLP or SPLP appears as comprehensive as that which was proposed in the work plan. Please provide some justification for these apparent inconsistencies with the work plan.

9. In accordance with the CTDEP Site Characterization Guidance....*A Phase II data evaluation requires knowledge of natural and/or background soil and groundwater quality based upon the weight of available evidence from multiple sources. Information to consider in evaluating whether concentrations of inorganic constituents are from a release or represent natural background concentrations includes:*

- *site-specific background data (representative data collected outside of any release area from soil with a similar texture and composition);*
- *occurrence with other contaminants (e.g., elevated concentrations [above background] of inorganic constituents and/or presence of man-made substances);*
- *leachability, particularly using the synthetic precipitation leaching procedure (SPLP) methodology for soil; and*
- *turbidity of groundwater samples.*

It is not appropriate to compare Phase II laboratory data to RSR criterion to determine whether or not a release has occurred or to demonstrate compliance with the RSRs. [emphasis added]

Throughout the report “typical background concentrations” are referred to yet there is no discussion of what typical background concentrations are and it does not appear as though any background samples were collected. Please clarify. Based on the above comments, it appears premature to be recommending “closure” of some of the areas at this time.

10. Were any saturated soil samples collected? Please revisit the need for collecting such samples particularly in areas where known or suspected release have occurred yet no significant contamination was detected in soils and in areas where groundwater contamination has been detected yet no specific source for the groundwater contamination can be identified.

11. The only bedrock well on site is MW-101 located upgradient of all known releases, AOC/SWMUs. Please propose the installation of deeper (additional nested wells) and/or bedrock wells or provide justification for not needing them.

Specific Comments

Page 3, Section 1.4 Environmental Setting

1. The 3rd paragraph states that groundwater in the shallow overburden generally moves in a south-southeasterly direction toward the Naugatuck River. Previous reports indicate that groundwater flows to the south-southwest (see also page 53 of this report.) A current groundwater contour map should be prepared.

Page 4

2. In the first paragraph it is stated that a fill layer consisting of building debris was identified in some locations. Please include this detail for each AOC where it was encountered.

Page 5, second para, Section 2.0 Regulatory Criteria

3. It is stated here that “This investigation was solely based on identifying releases to the environment....Generally, a release is indicated by detections above the RSRs. Comparisons of analytical data to RSR Criteria in this report are solely for reference and relative comparison and do not imply regulatory compliance. Compliance with the RSRS can depend upon several factors in addition to published numeric criteria.” Although compliance with the RSRs are key to

reaching remedy selection and construction complete for the facility, as stated as the objective of this work plan and above, the investigation was to identify releases to the environment. This needs to be done by comparison to background concentrations (refer to comment 9 above and comment 23 below).

Page 6, Section 2.2 Connecticut Soil Standards

4. Please verify if the north parcel is in a GA area and revise the text accordingly.

Page 7, Section 2.4 Connecticut Groundwater Standards

5. The proposed dilution factor for SWPC of 41.7 will be addresses following completion of the Screening Level Ecological Risk Assessment.

6. In the last paragraph to this section, please provide a reference to table 5, the list of groundwater elevations that have been collected at the site. This table should include a more comprehensive list of groundwater elevations. Page 9, section 4 notes that quarterly groundwater monitoring was conducted in 2007 and 2008.

7. Regarding the last sentence on this page, please provide a discussion of the variation in groundwater levels between June, August and April, December time frames. A difference of 20-26 feet in depth to ground water is significant and needs to be taken into consideration when evaluating the volatilization criteria.

Page 10, Section 4.2 Summary of Closure of Waste Management Units

8. Please clarify why 5 RCRA regulated units are discussed here versus 9 RCRA units discussed in section 2.1, page 5.

Page 12, Section 4.3 Ecological Risk Assessment

9. The last sentence should further clarify that "...remediation of the impacted soils will address ecological exposure pathways at AOC A."

Page 12, Section 4.4 Site-wide Stormwater Monitoring

10. Where is NPDES storm water sampled, at the site or at the stream? Have the storm drains and/or basins ever been cleaned out? Is there a continuing release from soils or groundwater that may be contributing to stormwater discharges to Steele Brook? Please provide a copy of the *General Permit for the Discharge of Stormwater Associated with Industrial Activity*, reissued October 2007.

Section 4.5 Summary of Areas of Concern

11. The last sentence on page 12 states that "... a site wide understanding of constituents found on the site can be understood through the tables and figures." It would be useful, and be supportive of the previous statement, if some contaminant distribution maps, and bar and/or line graphs illustrating concentration with respect to time or distance to predict contaminant trends at the site. Maps and graphs should be considered for tetrachloroethene, TPH, arsenic, copper, nickel, lead, zinc, and any other COCs that were detected in numerous wells throughout the site, particularly where concentrations in excess of the RSRs were identified.

Page 15 & 16 last paragraphs, Section 4.5.1 AOC Sludge Disposal Area

12. Please provide additional information regarding "typical background concentrations."

Page 16, 2nd and 3rd bullets

13. For the PCB, please include a second number in the range, or modify to read “a range from non-detect to x mg/kg.”

2nd para

14. If sludge was detected and is reportedly from the former sludge lagoons, what type of sludge is it (it is identified as metal hydroxide sludge, a listed waste F006, at the bottom of page 23)? Based on the process code, this is a listed hazardous waste and must be treated as such.

15. Two samples, SB-6 and SB-19 may not be sufficient to determine the characteristic of toxicity. Further, they not have been the most representative samples regarding whether or not the waste is characteristically hazardous since these samples were not submitted for mass metals in addition to TCLP. Please clarify if these were the samples that were documented as being discolored?

Page 17, Section 4.5.1.2

16. Two wells, one upgradient bedrock well and one downgradient overburden well are not sufficient to characterize groundwater flow in this area nor likely sufficient to understand the extent of groundwater contamination. MW-102 appears more side gradient than downgradient of the capped area.

17. Why was MW-101 installed as a bedrock well if it was intended to be an upgradient well that is representative of background groundwater concentrations. Also, why was it installed 50 feet (current figures) to 125 feet (Figure 2 April 2008 QAPP) from the capped area? Please rectify this significant discrepancy in distance. A proposal to install additional wells in this area to characterize groundwater quality and confirm the assumed groundwater flow direction is necessary.

Page 18 third para

18. “Downgradient” should likely read “upgradient.”

Page 18, Section 4.5.2 AOC-B 4,000-gallon No. 2 Fuel Oil UST

19. Figure 4 shows that this is a 5,000 gallon UST.

20. Please provide a reference for the UST removal documentation discussed here. If not previously submitted, please submit a copy. This AOC evaluation is not consistent with the work plan. Please review and provide the justification and/or the information requested above.

Page 19, AOC-C, Dry Chemical Silos

21. Regardless of the inferred groundwater contour, MW-47 appears more side-gradient than down gradient of this AOC.

22. In the work plan it was questioned why PCBs were proposed for analytes in groundwater but not soils (transformer(s) were identified in this area). This question does not appear to have been addressed in the revised work plan. The site characterization sampling did not include PCBs in either groundwater or soils. Please provide some rationale.

Page 21, Section 4.5.4 AOC-D1, Pilot Plant and QA/QC Labs and Small Packaging Area

23. In the second to last para for this section – please define “typical background concentrations.”

Page 22, Section 4.5.5, AOC-D2, Main Mixing Area

24. The 6th paragraph on this page states that one monitoring well MW-53 was installed to assess the groundwater quality yet no discussion of the results are included despite detections of arsenic and copper in this well in excess of the SWPC. This well may also represent groundwater from AOC-D1; groundwater was not discussed for this AOC either. The recommendation for both AOC-D1 and D2 is "closure of this AOC" which is premature in light of the arsenic and copper SWPC exceedances in MW-53.

Page 24, Section 4.5.6 AOC-E1, Former Waste Lagoons

25. Please provide a complete list of previous LNAPL measurements in all wells. The August 2007 Annual GWM Report provides the additional following information: During the July 2006 groundwater sampling event, LNAPL was observed in piezometer PZ-04 at a thickness of 7.71 feet. The product thickness in piezometer PZ-04 was measured at 3.99 feet in August 2004. During the October 2006 groundwater sampling event, LNAPL was observed in piezometer PZ-04 at a thickness of 4.25 feet. During the February 2007 groundwater sampling event, LNAPL was observed in monitoring well MW-108 at a thickness of 0.28 feet, and in piezometer PZ-04 at a thickness of 3.25 feet. During the May 2007 groundwater sampling event, LNAPL was observed in piezometer PZ-04 at a thickness of 3.19 feet.

Pages 27-33

26. Due to the lack of groundwater contours in the area of AOC E, the claims of "directly" up, down and side gradient are somewhat questionable. At this point in the investigation, it may be more appropriate to discuss GW flow and contaminants in more general terms (i.e., at least delete "directly" in groundwater flow direction discussions). Additional specific comments follow for this section.

Page 28, Section 4.5.7 AOC-E2, Wastewater Treatment System

27. MW-26, MW-36 and MW108 are also possible downgradient wells for this AOC. MW-36 is in closer proximity than MW-109 to the WWT system, and MW-108 is in closer proximity to the roll-off than MW-109. The results for these additional wells should be reviewed and discussed as appropriate.

28. Until closure of this and any other regulated unit has been satisfactorily documented, reviewed and the unit released from the liability insurance and financial assurance requirements, the units will not be formally "closed" based on the recommendations in this Site Characterization Report.

Page 30

29. Section 4.5.8 AOC E-3, Bulk Spent Copper Etchant Unloading and Bulk Storage Area MW-108, 109 and 26 are also likely downgradient wells for this AOC. Please discuss as appropriate.

Page 31, Section 4.5.9 AOC-E4, Spent Copper Etchant Recycling Area

30. In the last paragraph it states that "Copper has also exceeded the SWPC in wells up-gradient and side-gradient of this AOC. In fact, the concentration of copper is at its highest concentration in MW-44, which is located up-gradient of this AOC." Figure 2 shows it partly within the area identified as E4 and it may be side-gradient, but not likely upgradient. Please revisit and revise as appropriate.

31. MW-26, MW-109 and MW108 are also possible downgradient wells for this AOC. The results for these additional wells should be reviewed and discussed as appropriate.

32. The last sentence of this page seems misplaced and is confusing. The bulk copper etchant tanks are E-3, not E-2. Furthermore, neither PCE nor 1,2,4-trichlorobenzene are discussed under soils in either section, E-2 or E-3 but should be if there are potentially leachable concentrations identified for these areas.

Page 33, Section 4.5.10 AOC-E5 Acid Tank Farm

33. Please verify that this area was epoxy coated.

34. The third paragraph states that there are photos contained in Appendix C. These cannot be located. Please provide these photos. This may be incorrectly labeled as "AOC-D2 Satellite Storage Area." According to figure 2 AOC-D 1 is satellite storage and pilot plant and AOC-D2 is the main mixing area.

35. MW-36 appears to be located side gradient, not down gradient of AOC E5. According to figure 6, MW-108 and MW-26 are more likely located downgradient of this AOC and the results for these additional wells should be reviewed and discussed as appropriate.

Page 34, Section 4.5.11 AOC-E6

36. Recommendation of closure for the 1994 copper etchant release to Steel Brook is made yet Section 4.3, page 12, last paragraph to this section states "The Scoping-level ERA suggests a Screen-level ERA of the soils piles in AOC-A and sediments and surface water of Steele Brook be performed to identify potentially complete ecological exposure pathways in these areas related to the Site." Please revise this section's recommendations to be consistent with the SLERA recommendations.

Section 4.5.12 AOC-F Former 6,000 Gallon UST (East Aurora Street Building)

37. Please provide a source for the information regarding removing oil from the tank, cleaning and filling with foam. The last sentence states there documentation for this tank closure was not available.

Page 35, Section 4.5.13 AOC-G East Aurora Street Warehouse

38. If the source of the trichlorofluoromethane in soils is the active ingredient in the foam used to fill the tank for closure, does it indicate that the tank was not competent?

Page 36

39. In the last sentence of the second paragraph, the Main Container Storage Area should read Area A, not B. There is a typo in the parentheses.

40. The last sentence in the third paragraph states that "Photos of the closure process are contained in Appendix C." There are only 2 photos included. The first shows the area with the concrete floor removed and the second shows the floor replaced. This does not show the closure process. It was reported that an intact poly membrane was present beneath the concrete floor so no or limited soil samples were collected. It was requested that photos showing the intact liner be included in the closure report which were not. Please clarify.

Page 37

41. The third paragraph states that "...the types of chlorinated VOCs detected are solvents which were specifically not handled at this AOC and not identified as COCs in the closure plan." This AOC included the main hazardous waste storage area and the shipping and receiving area, it

seems logical that VOCs would have been handled in some manner at this AOC (i.e., Weren't VOCs received here? Were VOCs part of a waste stream?) Please clarify.

Page 38, AOC-H, Flammable Material Rack Storage Area

42. The soil sampling results for samples SB-56, SB-57 and SB-58 cannot be located. Please add these results to the table or discuss why they are not included in Table 3.

The last paragraph on this page states that "PCE and TCE are not flammable material and not likely associated with the flammable storage operations which occurred at this AOC. Please refer to Attachment A which contains two pages from EPA's Final RCRA Facility Assessment, dated September 1993 and prepared by TRC. This is also contained as Appendix B to MacDermid's March 16, 2001 RCRA Corrective Action Stabilization Report, prepared by HRP Associates. It states that solvents were stored here and references MacDermid waste manifests and waste minimization summary. More effort needs to be placed on identifying the source of the solvents, primarily PCE. Although there appears to be widespread low levels of PCE, SWPC is exceeded in two wells closest to the site boundary. Is it possible that more elevated concentration exist at depth and/or off site? How will this be evaluated?

The following is from the CTDEP Site Char Guidance.

Wells should be placed to find the groundwater plume boundaries, in three dimensions: laterally to find the horizontal limits at various depths to determine the vertical limit, and downgradient to establish the leading edge. Care should be taken when designing and installing monitoring wells to avoid cross-contamination between aquifers. If an on-site release extends offsite, the environmental professional must employ best efforts to delineate the extent of the off-site release.

Until an AOC is identified for these solvents, it's not appropriate to close out AOCs that are potential source areas.

Page 39, Section 4.5.15

43. Should the second bullet read 1,1,1-trichloroethane or trichloroethylene versus 1,1,1-trichloroethylene? See also last sentence on this page.

Page 40, Section 4.5.16 AOC-J 10,000 Gallon UST (Gear Street Building)

44. Soil boring SB-72 appears upgradient of the UST.

45. MW-111 is also a potential downgradient well for this AOC and the results should also be discussed as appropriate.

Page 43, Section 4.5.20 AOC K-4 Gear Street Industrial Wastewater Sump release

46. The second paragraph states that "two borings were immediately down-gradient of the former spill." Should this read "two borings were proposed..."? The work plan (QAPP) proposed one boring and one monitoring well for this location. Please provide justification for not installing a well at this location.

Page 45, Section 4.5.22 AOC-K6 Electroless Nickel

47. In the fourth paragraph on this page, please also note elevated nickel concentrations at downgradient sample SB-61.

Page 46, Section 4.5.2 AOC K-7 Satellite Storage Area

48. In the last sentence of the 2nd paragraph, it would be appropriate to modify the statement to read "...indicated a release in either sample from this AOC" since SB-70 indicated a release of nickel from AOC K-6.

49. The 3rd paragraph on this page contains a reference to the ink manufacturing area. Please revise as appropriate.

50. MW-62 is another potential downgradient monitoring well for this AOC and the results should be discussed as appropriate.

Page 49, Section 4.5.25 AOC-L Transformer Vault

51. Elevated chromium should be discussed.

Page 50, Section 5 Deviations from Scope of Work

52. Although MW-110 and MW111 may have been damaged, they have previous data available and should be shown on the figures. Please also show MW-107 on the figures.

53. MW-106 was previous identified as "inactive (lost)" in the table on Figure 2 of the QAPP and "destroyed" in the actual Figure 2 yet it is shown on the Site Characterization Report Figures without any such note. Please clarify this discrepancy.

54. In the first bullet, please verify if MW-44 is the replacement well for MW-110. MW-44 more likely replaced MW-106. Was MW-110 lost or damaged? The second sentence has the two replacement wells reversed (MW-48 replaced MW-111). MW-111 was damaged but is it still useable for groundwater measurements?

Page 51, Section 6 Data Usability Discussion

55. This section should state that the data was validated in accordance with the approved QAPP dated June 2008, if in fact it was.

56. Please clarify why the National Functional Guidelines were used for data validation instead of the R1 specific data validation guidelines available at the following web location
<http://www.epa.gov/region1/lab/qa/qualsys.html>

Section 6.2 Field Blanks

57. The previous section states that a deviation from the work plan included not submitting a trip blank per day (should state trip and field) – this section notes a field blank was not submitted daily. Please clarify why?

Page 53, Section 7.1 Site-Wide Groundwater Monitoring

58. The second bullet states that GW flow is to the south, south-west. Previous Sections state that it flows to the south, south-east. Please correct this or other sections of the report.

59. The third bullet states that LNAPL was detected in PZ-01. Please verify that this is correct. It should likely read PZ-04.

60. Another COC exceeding the SWPC that should be listed here is tetrachloroethene.

Page 54, Section 7.3 Scoping Level Ecological Risk Assessment, 4th bullet

61. Please provide additional information regarding "1994 remediation criteria."

5th bullet

62. Background concentrations of copper in sediments should be determined in order to help distinguish upgradient sources potentially contributed by releases from the MacDermid facility.

Page 55, Section 7.5 Areas of Concern, Further Remedial Investigation Recommendations

63. If additional investigation and/or remediation in regulated unit areas is required, the regulated units cannot be formally closed and released for financial assurance for closure.

Page 56, AOC-M

64. Please refer to the following location for guidance on further investigation and remediation of the LNAPL: <http://www.cluin.org/conf/itrc/LNAPLcr/resource.cfm>

Also, please note that a new Technical/Regulatory Guidance, Evaluating LNAPL Remedial Technologies for Achieving Project Goals is available at the following location:
<http://www.itrcweb.org/documents/LNAPL-2.pdf>

Page 58 and 59, Section 8 references

65. The February 2002 Phase I Site Assessment Report for the Vacant Parcel, prepared by LEA, Inc. should be included in the list of references and referenced as appropriate throughout the document.

Figure 6 Groundwater Contours

66. Please describe why the elevation at MW-74 appears to be depressed compared to the surrounding monitoring wells.

67. Please verify the appropriateness of inferred groundwater contour 266.5. Was the groundwater elevation measured at MW-103? If not, please provide justification.

The key indicates that the interpolated contours are the thin lines but the figure indicates that the inferred contours are the thin lines. Please revise as appropriate.

68. Additional groundwater contour maps are necessary to illustrate seasonal or temporal variations in groundwater flow direction and/or elevations, if they exist.

Table 1, page 3 of 3

69. Under the row for AOC J, last column under COCs, there is some information that has been cut off. Please submit a revised table.

Table 3

70. Table 8 page 3 of 22 (should read 3 of 11) 5 and 7 of 11 need to be revised as the GEI logo is obscuring some of the COCs listed.

71. The table on page 3 of this check list under stormwater states "Storm water discharges to Steel Brooke through discharges to the Naugatuck River." It should likely state the following which was taken from page 3, last paragraph of the Site Characterization Report. "Surface runoff from the Site flows into catch basins and is conveyed to Steele Brooke located approximately 900 feet to the southwest. Steele Brooke joins the Naugatuck River approximately 1,000 feet to the South."

Table 5

72. Available groundwater elevation data for MW-103, MW-107 and MW-110 should be included in Table 5.

73. Please verify the August 2004 depth to water and groundwater elevation data provided in this table. It does not agree with the data provided in the August 2004 LEA report.

74. Please provide the location from which the depth to water measurements were taken (i.e., top of riser).

75. Please verify that a consistent point has been established from which depth to groundwater and depth to bottom of well measurements will be taken. What appears to be variations of several feet in groundwater elevation in some wells and over 20 feet in wells MW-111 through MW-116 is most likely the results of using arbitrary datums. If this data cannot be corrected notes must be provided in the table to explain this. This table needs to be revised.

76. Please add the Feb 1995 and March 2001 groundwater elevation data to this table.

77. Please correct the footnote to reflect the actual date(s) of elevation surveys. Not all these wells existed in 2002.

Appendix A EPA-New England RCRA Corrective Action Ecological Receptor Exposure Pathway Scoping Checklist

Background Information

The following review of the Site Characterization Report (SCR) was to ensure that consideration of the ecological risk potential be correctly incorporated into the site investigation activities for this site. As a result of this review there are several overarching points pertaining to the work that are emphasize in the following comments. The attached review report supports these highlighted issues and provides a more in depth review response. A December of 2009 site visit was conducted to get an overview of the site characteristics that may be of ecological interest.

The site is generally broken down into a "South Parcel" and a "North Parcel." As discussed in the site characterization report (SCR) the South Parcel is overall industrial in nature and has little, if any, habitat to support terrestrial receptors. Therefore, any further assessment of ecological risk to terrestrial receptors, the only direct pathway associated with this parcel, would appear to be unwarranted. The reasons for this lack of further ecological risk evaluation should be well documented explaining both the lack of habitat, and so receptors, as well as the inaccessibility of contaminated soils due to some type of physical barrier. The North Parcel on the other hand, as described in the SCR, as well as observed during the site visit, provides substantive terrestrial habitat and is quite likely utilized by numerous upland species. The SCR has identified as least one area of concern (AOC), AOC-A, that is associated with the North Parcel where sampling has identified levels of contamination that warrant further ecological risk evaluation.

The identification of this complete terrestrial exposure pathway requires that at the least, a screening level ecological risk assessment (SLERA) be performed. This requires looking at the complete exposure pathways and comparing *surface soil* contaminants (0-1' depth), unless receptors are suspected to be exposed to contaminants at deeper (0-2') levels, to *ecologically* based soil screening level effects values. Results of this comparison are then used to support a decision of whether or not there is a need for further evaluation. Note that while it appears from

the SCR as well as the site visit that other areas of waste disposal in the north parcel do not appear likely, because of the habitat this area provides, it is the responsibility of MacDermid to thoroughly document that AOC-A is the only likely AOC to justify no further ecological risk evaluation would be necessary. At a minimum, the use of aerial photographs should be used to document the lack of disposal activities over the years.

Regarding aquatic ecological exposures associated with the site, the two that require further consideration are direct discharge by way of a direct outfall and groundwater discharge to receiving surface water bodies. The surface water bodies are Steele Brook to the SSW and the Naugatuck River to the south. Groundwater sample data show that there are multiple exceedances of Connecticut's surface water protection criteria (SWPC), some quite elevated. The recommendation in Section 7.1 of the SCR for a site wide groundwater monitoring plan is justified. To address ecological concerns one objective of this plan should be to quantify the flow path of these SWPC exceedances and to evaluate the potential for risk to aquatic receptors in nearby receiving water bodies.

An evaluation of risk from point source discharges related to the site is also warranted based on information provided in the scoping checklist. A 1994 copper etchant release was documented with surface water and sediment samples that were collected at that time. According to the scoping checklist, "the highest concentrations of copper were generally found at the point of discharge with concentrations declining further downstream." The last paragraph on page 8 of the scoping checklist states that "....nickel and zinc sediment concentrations are higher in samples collected upstream." Since copper and lead were analyzed for along with nickel and zinc, this infers that copper and lead were lower upstream. Additionally, Section 7.4 of the SCR briefly discusses storm water discharges and the fact that MacDermid met its general permit requirements. Results in Appendix B, the 2008 storm water permit report indicate that, at least for this wet weather event, MacDermid met permit requirements. However, discharge permit requirements don't take into consideration longer term sediment contamination and so do not necessarily guarantee protection of aquatic receptors.

Lastly, as noted during the December site visit it should be recognized that there are potential sources of contamination downstream of MacDermid prior to the outfall point. Considering all of this information as well as the requirement to at least screen for ecological risk potential from all identified complete aquatic exposure pathways, an evaluation of sediments in Steele Brook should take place to determine if sediments in the brook down gradient of the outfall do exceed ecological sediment effects screening values.

1.0 GENERAL INTRODUCTION

The MacDermid Facility (the Site) was an industrial facility from before 1916. MacDermid started manufacturing at this site around 1930, purchased the property in 1950, and closed the site in 2003. The information available for review did not list all of the industrial activities that took place over time, except for the manufacturing of ball bearings.

The site consists of two parcels of land separated by Huntingdon Avenue, which consists of a two-lane road. The South Parcel covers about 11 acres and contains the old manufacturing facility. The entire parcel is fenced-off and covered by several buildings, parking areas, and roads. It supports minimal ecological habitat, except for a small patch of grass, estimated to cover less than one acre. Past site investigations have identified used cutting oils in the subsurface of this grassy area as a result of historic waste disposal activities. This impacted area is slated for remediation.

The North Parcel covers about 30 acres of second-growth forest. The only reported industrial activity on this piece of land appears to have been the disposal of sludges excavated in the mid 1980's from two waste lagoons located on the south parcel. This material was then covered over

by an asphalt "cap" to avoid exposure and run-off. In addition, several small, site-related, and potentially contaminated soil piles were dumped around the cap in the past. The sludge material is scheduled to be excavated for proper disposal. The soil piles were excavated in December 2009 as an interim corrective measure. A report has not yet been submitted.

This technical memorandum is organized as follows: Section 2.0 provides general comments on the site investigation report, Section 3.0 provides specific comments on the site investigation report, Section 4.0 highlights the findings of the site visit, and Section 5.0 provides a summary and conclusion.

2.0 GENERAL COMMENTS

General comment 1:

As indicated in the Executive Summary and the Introduction, a Scoping-level Ecological Risk Assessment (ERA) was conducted for the MacDermid site as required under the Stewardship Permit. Since the Connecticut Remediation Standard Regulations (RSRs) address human health risk concerns, the ERA is needed to ensure that potential ecological risks are addressed and are considered when evaluating remedial options. It is recognized that the South Parcel is primarily industrial with incomplete ecological exposure pathways; however, the North Parcel contains significant wildlife habitat and warrants an evaluation of potential for ecological risks.

Two surface water bodies in the vicinity of the site also provide habitat to aquatic receptors. The report should clarify that the evaluation of media against RSRs (i.e., soils compared to Residential Direct Exposure Criteria (RES DEC), Industrial/ Commercial (I/C) DEC, or Pollutant Mobility Criteria for Groundwater "B" areas (GB PMC)) only considers risks from a human health perspective. Groundwater exposure pathways must also be considered from an *ecological* perspective through the use of Connecticut's surface water protection criteria (SWPC).

General comment 2:

The report should clarify that the purpose of the Scoping-level ERA was only to identify potentially complete exposure pathways (i.e., co-located ecological habitat and site-related releases) to identify the need for further ecological risk evaluation. A quantitative evaluation of ecological risks has not yet been conducted (RSRs do not address ecological risk). The Scoping-level ERA in Appendix A concluded that a Screening-level ERA (SLERA) was warranted for Area of Concern (AOC)-A and Steele Brook. If complete exposure pathways of ecological concern are identified a SLERA must be performed which evaluates analytical data from the appropriate media against ecological screening values and should be submitted as a separate document.

General comment 3:

The organization of the SCR is such that the Scoping-level ERA is discussed in Section 4.3 before the reader is introduced to the two areas where complete ecological exposure pathways were identified (i.e., AOC-A soil and Steele Brook). It is recommended to expand Section 4.3 by summarizing the ecological site survey conducted on November 12, 2008 and identifying the potentially complete exposure pathways, including the source(s) of potential contamination and the potentially exposed receptors.

A preliminary evaluation of available data against ecological screening values should also be discussed in Section 4.3 since a "review of existing analytical data" was a task identified in the work plan but not included in this section. While some of this information was presented in other sections of the report or in the Scoping Checklist in Appendix A, an expanded Section 4.3 would provide a more complete Scoping-level ERA discussion and would support the findings presented in Section 7.3.

General comment 4:

Ecological risk is discussed in Sections 4.3 and 7.3, and the Scoping Checklist in Appendix A. However, much of the supporting information about the AOCs with potential ecological exposure

pathways was provided in Section 4.5 (Summary of Areas of Concern). It would be helpful if the information about releases provided in Section 4.5 was included in Section 4.3 and the Scoping Checklist so that the summary in Section 7.3 better reflects information from the ecological risk sections of the report.

Inconsistencies were found between Sections 4.3, Section 7.3, and the Scoping Checklist that make the path forward unclear. For example, Section 7.3 indicated that soil remediation was recommended for AOC-A, but failed to indicate that a SLERA will be conducted for AOC-A and Steele Brook, as recommended in Section 4.3 and the Scoping Checklist. Additionally, Section 4.3 states that a SLERA is warranted for Steele Brook and yet Section 7.3 does not provide acceptable justification for excluding Steele Brook from any further evaluation. Since a complete exposure pathway (e.g. stormwater, historic discharges and spills) exists between the site and the brook the need for further evaluation and possible remediation should be considered only after completing a SLERA.

3.0 SPECIFIC COMMENTS

Specific comment 1: §4.3 Ecological Risk Assessment, first bullet, p. 11.

The first bullet indicated that the existing analytical data were reviewed as part of the ERA. The Scoping Checklist (p. 11) mentioned surface soil concentrations above RSRs, but the RSRs do not address the potential for ecological risk and no information was provided in Section 4.3 to indicate what data were considered or what chemicals might be present at levels of ecological concern. A simple comparison of soil data from areas with potentially complete ecological pathways (i.e., AOC-A) to EPA's Ecological Soil Screening Levels (Eco-SSL; available at <http://www.epa.gov/ecotox/ecoss/>) should be considered and discussed in Section 4.3. This screening would not replace the SLERA recommended by the Scoping Checklist, but would provide some preliminary insights.

Specific comment 2: §4.3 Ecological Risk Assessment, first ¶, p. 12.

The last sentence refers to an ecological site survey performed on November 12, 2008. However, the findings of this survey were not presented in the body of the report or in the Scoping Checklist. It is recommended to include field notes, photographs or other materials from this survey (if available) to provide a more detailed discussion of the potential ecological habitat provided by the North Parcel and Steele Brook and to support the observed lack of habitat at the South Parcel.

Specific comment 3: §4.3 Ecological Risk Assessment, second ¶, p. 12.

The second sentence indicated that "appropriate engineering controls" are in place to prevent exposure of ecological receptors to potentially contaminated media. It was also implied in this paragraph that subsurface soils were the primary contaminated media in the South Parcel. This paragraph should identify the specific engineering controls (e.g., fencing, pavement) that prevent ecological exposure to site-related contaminants. It should also clarify that the potential releases within the South Parcel would not typically result in exposure for terrestrial ecological receptors (e.g., releases to sub-surface soil or groundwater as opposed to a spill to the ground surface).

Specific comment 4: §4.3 Ecological Risk Assessment, third ¶, p. 12

This paragraph discussed the portion of the site, AOC-A in the North Parcel, that appears to provide potentially complete exposure pathways for ecological receptors. However, in the absence of a more detailed ecological habitat description and discussion of the available analytical data, the references to the "paved cap" and "piles" are unclear. Even though it is recognized that AOC-A is discussed in detail in Section 4.5.1; it is recommended to provide an overview of the AOC (e.g., habitat description, sources of releases, points of exposure, potential receptors) in the ERA section so that the complete exposure pathways are identified and the reader can be referred to Section 4.5.1 for more details.

Specific comment 5: §4.3 Ecological Risk Assessment, third ¶, p. 12.

The last sentence indicated that the piles next to the paved cap provided an area of potential exposure and should be removed. However, no ecological basis for this removal action is provided. Soil concentrations above RSRs may indicate a potential for human health risks, but do not consider ecological risk. The available soil data should be compared against ecological screening values to determine if removal is also warranted for ecological purposes. Since the excavation of the soils was completed prior to the performance of a SLERA, it is appropriate to evaluate post-excavation results in the SLERA to confirm that remaining concentrations are acceptable from an ecological risk perspective. Other portions of the report (Section 4.5.1.2.2; Section 7.5) indicated that the asphalt cap and associated wastes will also be removed. Ecological receptors could be exposed to residual materials (depending on whether or not the excavated area is backfilled) in the absence of the cap. These data should also be evaluated in the SLERA to confirm that ecological risks after remedial action are acceptable.

Specific comment 6: §4.3 Ecological Risk Assessment, fourth ¶, p. 12

This paragraph indicated that the Scoping-level ERA suggested performing a SLERA for the soil piles in AOC-A and surfacewater and sediment of Steele Brook to identify potentially complete ecological exposure pathways. The purpose of the Scoping Checklist was to identify the potential for complete exposure pathways not the SLERA. The focus of any future SLERA will be to evaluate the potential for ecological risks due to these complete exposure pathways. The text should be modified accordingly.

Specific comment 7: §4.3 Ecological Risk Assessment, fourth ¶, p. 12.

The first sentence provided the first reference to the potential for complete exposure pathways associated with Steele Brook. This section should provide an overview of the brook (e.g., habitat description, sources of releases, potential receptors) so that the complete exposure pathways are identified. The reader can be referred to Section 4.5.11 for additional details.

Specific comment 8: §4.5.1.2 Work Plan Implementation, fourth ¶, p. 14.

The second sentence in this paragraph indicated that removal of the soil piles is recommended as part of an interim remedial action. It is recommended to conduct post excavation soil sampling to confirm that residual contamination in AOC-A falls below ecological screening levels associated with risks to ecological receptors.

Specific comment 9: §4.5.1.2 Work Plan Implementation, fourth ¶, p. 15.

The second sentence in this paragraph indicated that removal of the cap and underlying material is recommended as part of an interim remedial action. It is recommended to conduct post excavation soil sampling and comparison to relevant ecological screening values to confirm that residual contamination in AOC-A falls below ecological screening levels associated with risks to ecological receptors.

Specific comment 10: §4.5.11.2 Work Plan Implementation, first ¶, p. 34.

Heading 1 of this section indicated that implementing the work plan included comparing previous sediment sampling results to current ecological screening values. However, this section only referred the reader to a 1994 report which presented sediment results for copper, nickel, lead, and zinc. Being consistent with the workplan, it is recommended to compare these data against current ecologically-based sediment screening values. In addition, while it is recognized that upstream sources may also contribute metals to Steele Brook sediments that does not eliminate the need to evaluate the risk of releases from the Site.

Note that the December 11, 2009 site visit found that up to three other businesses are connected to the underground pipe which carries storm water from the Site to Steele Brook. Those businesses are located "downgradient" from MacDermid. Ultimately, it may be a challenge to link the current quality of the surface water and sediment in Steel Brook downstream of the outfall pipe directly to the Site. Again, this, in and of itself, does not preclude performing an aquatic SLERA.

Specific comment 11: §7.3 Scoping Level Ecological Risk Assessment, Findings, p. 54.

The bullets in this section summarized the findings of the Scoping-level ERA. Most of this information was discussed in the Scoping Checklist and not in Section 4.3 of the report and some of the findings are based on materials discussed in the Section 4.5 (Summary of Areas of Concern). As indicated in General Comment 4, the information in Sections 4.3, 7.3, and the Scoping Checklist should be internally consistent.

The third bullet stating the possibility of soil impacts at AOC-A is perhaps true but the assessment referenced in this bullet was not performed based on a review of ecologically effects threshold values but rather on RSRs which are human health based. This bullet should be edited as such or suspended until proper ecological screening values are used to support the stated conclusion.

The information presented in the fourth and fifth bullets was provided in Section 4.5.11 and the Ecological Checklist, but not in Section 4.3. Discussion of this information in Section 4.3 would be helpful.

The final bullet presented the first mention of active stormwater discharges to Steele Brook. Potential impacts to Steele Brook from ongoing stormwater inputs from the site should also be discussed in Section 4.3. Such a discussion should be supported by a review of contaminants found in stormwater samples and how those contaminant levels compare to Connecticut's ambient surfacewater quality criteria.

Specific comment 12: §7.3 Scoping Level Ecological Risk Assessment, Recommendations, p. 54.

This bullet recommended that residual soil impacts at AOC-A be addressed through a remedial action plan. While this action may be warranted for reasons other than ecological risk, the removal action itself does not eliminate the need for an ecological evaluation. The absence of an ecological evaluation should be presented here since Section 4.3 indicated that a SLERA was warranted for soils at AOC-A, and surface water and sediments in Steele Brook. If the soil piles and paved portion of AOC-A are removed, surface soils remaining require that a SLERA be performed to confirm that residual soil contamination will fall below levels of concern for ecological receptors.

Specific comment 13: Table 1, Conceptual Site Model.

This table identified the various areas of concern, sources, release mechanisms, data gaps prior to the Site Characterization Investigation sampling, potentially impacted media, and contaminants of concern. Although the Scoping-level ERA did not represent an AOC in the traditional sense (see 3rd row in Table 1), it was part of the site investigation activities.

If the Scoping-Level ERA is to be included in the table, all of the cells should be filled in such that it does not appear that a topic was overlooked. Currently, the cells for "Sampling Objectives to Address Data Gaps" and "Contaminants of Concern" are blank. The cell, "Sampling Objectives to Address Data Gaps", should state if sampling was not conducted to address data gaps. Perhaps there needs to be some text discussing activities other than actual sampling that were used to enhance knowledge of ecological aspects of the site. For example, the ecological site survey conducted on November 12, 2008 could be mentioned if the purpose was to identify complete exposure pathways. The "Contaminants of Concern" cell could refer to constituents in particular areas or associated with certain releases (e.g., constituents in AOC-A soils, constituents related to the AOC-E-6 1994 Spent Copper Etchant Spill). It is recommended to complete the third row in Table 1 accordingly.

Specific comment 14: Table 9, Summary of Data Quality Objectives and Results.

This table summarized the sampling objectives and investigative findings for the various AOCs. Review of the table found that the table erroneously did not indicate the need for remedial activity at the Soil Disposal Area portion of AOC-A. Section 4.3 recommended removing the piles to eliminate complete ecological exposure pathways, whereas Section 4.5.1.2 recommended

removing the piles as an interim remedial action. The need for a remedial activity in this area should be revised in the table. Notes associated with the particular sampling objective for AOC-A fail to state the contaminated material extends further to the east as well according to the first paragraph on Page 17 of the SCR.

For AOC E-5, it is recommended that the notes for this AOC include that monitoring well results from MW-109 exceed Connecticut's SWPC for Cu, Ni and Zn.

For AOC E-6, the table indicated that sediment results from 1994 are not "technically suitable" to compare to ecological screening values. The basis for this statement was unclear. This statement should appear in Section 4.5.11.2 and should be justified or the 1994 sediment data should be compared to current ecological effects screening values.

Specific comment 15: Appendix A, Ecological Receptor Exposure Pathway Scoping Checklist, p. 3

Note that review of the table on this page has identified an inconsistency. This table states that groundwater flow is to the east toward and into the Naugatuck River. However, Section 7.1 of the SCR states that groundwater flow is to the SSW in the shallow overburden. Clarification of this apparent inconsistency is required because of the ramifications on possible future MW sampling and/or placement to assess flow and concentrations of those contaminants that exceed SWPCs.

Specific comment 16: Appendix A, Ecological Receptor Exposure Pathway Scoping Checklist, p. 5.

This table summarized the potential ecological habitats and whether or not site-derived contaminants were present in those habitats. The half of the table identifying the location of habitats indicated that rivers, streams, and wooded habitats are present. However, the portion of the table addressing the presence of site-derived contamination within these areas was not completed. In order to meet the objective of the scoping checklist this portion of the table should be filled out for the two habitat types identified at or adjacent to the site.

Specific comment 17: Appendix A, Ecological Receptor Exposure Pathway Scoping Checklist, p. 6.

Under the "Habitat Documentation Rationale and References" the 3rd paragraph again states that groundwater flows to the east. Section 7.1 of the SCR indicates that groundwater flow is to the SSW in the shallow overburden. Clarification of groundwater flow is recommended.

Specific comment 18: Appendix A, Ecological Receptor Exposure Pathway Scoping Checklist, p. 7.

The "Surface Water" section indicated that surface water was not expected to be impacted due to releases from the facility. It should be confirmed that the concentrations of constituents detected in stormwater are below levels that could result in impacts to ecological receptors in Steele Brook. This information should be included in the rationale section on page 8, along with the information about upstream contributions of metals to Steele Brook. The presence of upstream sources of metals does not mean that facility contribution through stormwater should not be evaluated.

Specific comment 19: Appendix A, Ecological Receptor Exposure Pathway Scoping Checklist, p. 8.

In the 3rd paragraph of this page it is stated that discharges from facilities downstream from MacDermid pose a potential ecological risk for impacts to Steele Brook admittedly without specific information to support this contention. It is recommended that this be stricken or supported if relevant to this site investigation.

Specific comment 20: Appendix A, Ecological Receptor Exposure Pathway Scoping Checklist, first ¶, p. 9.

This paragraph stated that the lack of a human health pathway to sediment did not preclude a complete ecological pathway. The paragraph further indicates that impacts to Steele Brook could be from anyone of several sources. This may be true; however, the presence of upstream

sources of contamination does not mean that historic or current facility contributions should not be evaluated in a SLERA.

Specific comment 21: Appendix A, Ecological Receptor Exposure Pathway Scoping Checklist, second ¶, p. 9.

It should be confirmed that the concentrations of constituents detected in stormwater are below levels that may result in impacts to ecological receptors in Steele Brook. It would be useful to provide information about the historic industrial discharges to Steele Brook, if available. It would also be helpful if the text specified whether impacts of this discharge on Steele Brook were evaluated before or after the discharges ceased in 1997.

Specific comment 22: Appendix A, Ecological Receptor Exposure Pathway Scoping Checklist, third ¶, p. 9.

This section indicated that potential migration of contaminated groundwater was under control and not expected to impact the Naugatuck River. The comparison of tetrachloroethylene (PCE) concentrations against a human health based SWPC was not relevant to this section. For the purpose of ecological risk assessment the determination of potential impacts from contaminant concentrations in groundwater, if they were to discharge to the Naugatuck River, should be made based on exceedances of ecologically-based water quality screening levels.

Pages 8 and 9

Throughout the rest of the report it's stated that the facility closed in 2002 and no longer had industrial discharges. At the writing of this report, that would have been 7, not 12 years since industrial discharges ceased. Please revise as appropriate.

Page 9 Surface water bodies rationale and references

It's not clear why the last paragraph only discusses PCE when several metals also exceeded the SWPC. Please expand this discussion to include other COCs in groundwater detected in excess of the SWPC (e.g., arsenic, copper, nickel and zinc).

Specific comment 23: Appendix A, Ecological Receptor Exposure Pathway Scoping Checklist, second ¶, p. 11.

This paragraph indicated that impacted soils were present in AOC-A under an asphalt cap and that several piles of soil and debris were also found in this area. Some confirmation that the North Parcel has been sufficiently investigated to identify all of the likely disposal areas is important and necessary. Ecological receptors may be exposed to contaminants at other potential disposal locations in this parcel, considering that this area provides good terrestrial habitat. If additional disposal areas are suspected, those areas should be sampled for evaluation in the SLERA.

It is not clear what "The previous surface soil checklist..." is referring to. If it is referring to the Human Exposure Under Control EI then this should be deleted as it's not relevant to this ecological screening checklist. Otherwise, please explain.

Specific comment 24: Appendix A, Ecological Receptor Exposure Pathway Scoping Checklist, fourth ¶, p. 11.

This paragraph indicated that impacted surface soils at AOC-A will be remediated and no further evaluation of risks to ecological receptors would be required. Note that an evaluation of ecological risks has not yet been conducted because the comparison to RSRs does not consider ecological risk. The results of the Scoping-level ERA indicated that potentially complete exposure pathways existed at AOC-A concluding that a SLERA was warranted. A SLERA should be conducted using post-removal action samples after the impacted soils under the asphalt cap and in the areas where the soil piles have already been removed from AOC-A to confirm that residual contamination is not an ecological risk concern. The remediation plan should include clarification on how "institutional controls" would eliminate ecological exposures to impacted soils.

Specific comment 25: Appendix A, Ecological Receptor Exposure Pathway Scoping Checklist, first ¶, p. 13.

The intention of this section was to provide the rationale to support the sub-surface soil statements reached on the previous page. However, the reader was referred to the Site Characterization Work Plan for an overview of sub-surface soil impacts. While referencing other documents is often fine, this section would be more useful if it provided a brief summary of the impacts and the specific engineering controls in place to support the finding that sub-surface exposure is unlikely and further evaluation is not warranted.

Specific comment 26: Appendix A, Ecological Receptor Exposure Pathway Scoping Checklist, third ¶, p. 15.

Further evaluation of surface water and sediment in Steele Brook and surface soil in AOC-A is warranted based on the findings of the Scoping Checklist. This conclusion is consistent with the findings presented in Section 4.3 of the SCR. It should be noted that the statement saying that "ecological risk will be addressed in the remedial investigations and remedial action" has not been substantiated thus far based on the available evidence presented. The text should specify that a separate SLERA will be conducted.

4.0 SUMMARY AND CONCLUSIONS

The goals of the review were as follows:

- Perform a comprehensive review the ERA portions of the Site Characterization Report provided in Sections 4.3, 7.3, and Appendix A. Additional supporting information in Section 4.5 was also reviewed.
- Assess the ability of the ERA to support risk management decision making.
- Identify any data gaps and limitations with the ERA.

Several issues with the ERA were identified during the review and are summarized below:

- Comparing analytical data to CT RSRs does not consider ecological risks and that remedial actions taken to address RSR exceedances (i.e., soil removal at AOC-A) may not protect ecological receptors.
- The Ecological Scoping Checklist showed that potentially complete ecological exposure pathways exist for AOC-A and Steele Brook, thereby triggering the need for a SLERA. This recommendation should be made clear in Sections 4.3 and 7.3 SCR.
- It should be confirmed that AOC-A has been thoroughly investigated for the presence of impacted material or disposal areas. An ecological site survey was performed on November 12, 2008, but a summary of the findings was not provided. The North Parcel provides terrestrial habitat; ecological receptors may therefore be exposed to contaminants at other disposal locations within this parcel. Any additional disposal areas should be sampled and evaluated in the SLERA, as necessary.
- The removal of impacted surface soils from AOC-A to address RSR exceedances and the presence of other sources of non-site related contaminants would not eliminate the need to evaluate site associated complete exposure pathways for ecological risks. At a minimum a SLERA should be conducted using post-remediation samples to confirm that any residual contamination in either surface soils or surface sediment are below levels of ecological concern after the impacted media have been remediated.

Supplemental Investigation Material submitted on CD February 20

1. Field notes and chain of custody forms should not be considered supplemental information and should have been submitted as part of the Site Characterization Report. Only the 2008 forms were legible on the CD that was sent. Please ensure that this CD alone does not become part of the report and that legible copies are included (the files DUSRs_form1s do contain legible copies).

Field Notes

2. Changes or errors in filed notes and chain of custody forms should not be scribbled out. They should be crossed off with a one single line (so they are still legible) and initialed.

3. It's not clear from the field notes why samples were collected in some boring locations and not others. There are a significant amount of boring locations where no samples were collected. Alternately, there were samples collected at some location but no justification is provided (e.g., staining, odors observed, etc).

4. The notes never indicate that soil headspace screening was conducted on any soil samples in accordance with the work plan proposal and SOPs. Please clarify.

5. Why wasn't an interface probe available when for measuring product in wells/piezometers on 12/18?

6. Please clarify the note on page 37 regarding MW-117 S & D having large and small wells. Please clarify what is written on the table on page 37 regarding these wells; it's not completely legible.

7. Most of the scanned copies of the field notes are not legible. Please submit legible copies.

8. Page 16 of field notes, 5/01/09 noted that boring SB-65 had a slight chemical odor and sludge and a sample was collected for analysis. Why is SB-65 crossed off the chain of custody form? A lab report for this sample cannot be located. Refer to Job No. 220-8986-1, SDG 220-8986. Please clarify.

Data Validation and Reasonable Confidence Protocols (RCP) Summaries

9. Why isn't there a RCP checklist for Job No. 220-8934-1, SDG 220-8934; Job No. 220-8960-1, SDG 220-8960; Job No. 220-8986-1, SDG 220-8986; Job No. 220-9062-1, SDG 220-9062, Job No. 220-9354-1, SDG 220-9354; Job No 220-8934-2, SDG 220-8934; Job No. 220-8960-2, SDG 220-8960; Job No. 220-8986-2, SDG 220-8986; Job No. 220-8994-2, SDG 220-8994, Job No. 220-9004-1, SDG 220-9004. Typically, only a narrative is provided.

10. Why are metals limited to Cr, Cu, Ni, Co, and V for CC-4, and Cr, Co, Pb and V for SB-54 (Job No 220-8934-2, SDG 220-8934); and As, Cr, Co, Pb and V for CC-9 and CC-10 (Job No 220-9062-2, SDG 220-9062)? This does not appear to be consistent with the work plan. Please clarify.

11. Why is MW-116S crossed off the chain of custody from and not analyzed (refer to Job No. 220-9354-1, SDG 220-9354)?

12. What are the solid samples with the prefix SCER? Please refer to job number 220-11135-1, SDG Number: 220-11135. These results cannot be located in the report.

13. Are the following results reported in summary tables? Please clarify where these samples are from and include in the summary tables and text as appropriate. (Samples 220-11134-1 through 220-11134-6 were analyzed for SPLP metals in accordance with EPA SW-846 Method 1312/6020. The samples were leached on 12/23/2009, prepared on 01/04/2010 and 01/07/2010, and analyzed on 01/05/2010 and 01/11/2010).

Job no. 220-11134-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
220-11134-1	SS-1	Solid	12/18/2009 1300	12/18/2009 1750
220-11134-2	SS-2	Solid	12/18/2009 1310	12/18/2009 1750
220-11134-3	SS-3	Solid	12/18/2009 1325	12/18/2009 1750
220-11134-4	SS-4	Solid	12/18/2009 1335	12/18/2009 1750
220-11134-5	SS-5	Solid	12/18/2009 1345	12/18/2009 1750
220-11134-6	SS-6	Solid	12/18/2009 1350	12/18/2009 1750

ATTACHMENT A

**Page A17 and 46 from the EPA Final RCRA Facility Assessment
dated September 24, 1993 and prepared by TRC**

AOC Number: 12

AOC Name: ~~Flammable Rack Storage~~

AOC Status: ~~High potential for release~~

AOC Description:

The Flammable Rack Storage area consists of an outdoor, four-tier drum rack, approximately 40 feet high, 25 feet deep and 40 feet long (TRC, 1993). Raw flammable chemicals are stored secured in drums on the rack, on the grass between the Gear Street and Huntingdon Avenue buildings (TRC, 1993).

AOC Start-Up Date: Unknown

AOC Closure Date: Currently in use.

Wastes Managed at AOC:

Materials stored in this AOC include raw flammable chemicals such as alcohols, solvents, acetone, etc. (MacDermid, 1993a,b).

Release Controls:

The drums are secured to the rack and the rack is outside (TRC, 1993). There are fire hydrants nearby, but there is no spill containment. Catch basins in the driveway could channel spills to Steele Brook or spills might be absorbed by the soil on which the rack is set (TRC, 1993).

Release History:

~~Known Releases: There is no history of release from this AOC.~~

Release Evidence:

No analytical data exist to document a release from this AOC. No detections were noted using the Thermoenvironmental OVM Model 501-A, 10.2 Ev lamp during TRC's VSI on May 5, 1993 (TRC, 1993). Information pertaining to the volume, toxicity, and mobility of wastes at this AOC is not available.

Kingsbury, S. (Environmental Analyst, Connecticut Department of Environmental Protection, Natural Resources Center), 1993. Letter to Catherine Gabis of TRC. Re: Natural Diversity Database Printout, Waterbury, Connecticut, March 29, 1993.

MacDermid, 1985. Annual Connecticut Regulated Waste Report for 1984 submitted to the CTDEP by C. Gillis, MacDermid, Inc., April 25, 1985.

MacDermid, 1987. Annual Connecticut Regulated Waste Report for 1986 submitted by C. Gillis, MacDermid, Inc., February 16, 1987.

MacDermid, 1988. Annual Connecticut Regulated Waste Report for 1987, submitted to the CTDEP by C. Gillis of MacDermid, Inc., January 29, 1988.

MacDermid, 1991. Annual Connecticut Regulated Waste Report for 1990, submitted to CTDEP by C. Gillis, MacDermid, Inc. February 5, 1991.

MacDermid, 1992. Annual Connecticut Regulated Waste Report for 1991, submitted by C. Gillis, MacDermid, Inc. January 14, 1992 to the CTDEP.

MacDermid, 1993a. Hazardous materials manifests, MacDermid, Inc., 1993.

MacDermid, 1993b. Waste minimization summary, MacDermid, Inc., March 16, 1993.

Meade, 1987. Ground water yields for selected stratified-drift aquifers in Connecticut. D. Meade, U.S. Geological Survey, with the CTDEP, 1:125000.

Nelson (TRC), 1991. Telephone conversation between J. Nelson (TRC) and D. Radke. Bridgeport Hydraulic Company, re: Wellhead Protection Areas in Connecticut, September 22, 1991.

→ NUS, 1987. Preliminary Assessment completed at the MacDermid, Huntingdon Avenue facility by D. Geithner, NUS Corp., April 29, 1987.

NWI, 1980a. National Wetlands Inventory Map, Waterbury Quadrangle, U.S. Department of the Interior, April, 1:24000.

NWI, 1980b. National Wetlands Inventory Map, Torrington Quadrangle, U.S. Department of the Interior, April, 1:24000.

NWI, 1980c. National Wetlands Inventory Map, Mount Carmel Quadrangle, U.S. Department of the Interior, April 1:24000.

NWI, 1981a. National Wetlands Inventory Map, Naugatuck Quadrangle, U.S. Department of the Interior, April 1:24000.

NWI, 1981b. National Wetlands Inventory Map, Ansonia Quadrangle, U.S. Department of